

Amendments to the Drawings:

The attached drawing sheet includes changes to Figure 12. Figure 12 has been amended to correct a minor typographical error. Specifically, "CPB" has been changed to "CBP," which is consistent with the other label in Figure 12, i.e. "composite material (CBP+MoOx)," and with the present specification, for example, at paragraphs [0141] and [0142] (referring to the pre-grant publication, i.e. U.S. Publication No. 2008/0191611). This sheet, which includes Figure 12, replaces the original sheet including Figure 12.

Attachment: Replacement Sheet

REMARKS

The Official Action mailed January 14, 2010, has been received and their contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on July 27, 2006; September 21, 2006; and November 9, 2009.

A Correction to Previously Submitted Information Disclosure Statement is submitted herewith, which corrects the Information Disclosure Statement previously filed November 9, 2009. Specifically, the publication date of JP 2824411 was previously incorrectly listed as "09/04/1998" and, by the present *Correction*, has been changed to "11/11/1998." In the *Correction*, the Applicant requests that the attached PTO 1449 Form be initialed and that the previous erroneous citations be lined through.

Claims 1-9, 13-21 and 25-29 are pending in the present application, of which claims 1-4, 8, 9, 13-16, 20 and 21 are independent. Claims 1-4, 8, 9, 13-16, 20, 21 and 27-29 have been amended to better recite the features of the present invention. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 5 of the Official Action rejects claims 1-3, 5, 6, 8, 9, 13-15, 17, 18, 20, 21, 25, 26 and 28 as obvious based on the combination of U.S. Publication No. 2003/0218418 to Sato, U.S. Publication No. 2002/0086180 to Seo and U.S. Patent No. 6,084,176 to Shiratsuchi. Paragraph 6 of the Official Action rejects claims 1, 4, 7-9, 13, 16, 19-21, 25, 26 and 28 as obvious based on the combination of Sato, Seo and U.S. Patent No. 5,487,953 to Shirota. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2144.04, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some reason, either

in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some reason to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims. Independent claims 1-4, 8, 9, 13-16, 20 and 21 recite a composition comprising an organic compound and a metal oxide or a layer including an organic compound and a metal oxide. For the reasons provided below, Sato, Seo and Shiratsuchi or Shirota, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

In the "Response to Arguments," the Official Action asserts that "[o]ne of ordinary skill in the art would reasonably expect advantageous [effects] of having a hole injection layer taught by Sato et al. to be retained in the mixed layer because these effects come from the hole injection material which has been added to the hole transporting layer" (page 23, Paper No. 20100107). However, as stated in the *After Final Response* filed September 9, 2009, Sato does not disclose a composite material comprising an organic compound and a metal oxide. Sato merely discloses a structure where a hole transporting layer is over a hole injection layer (paragraphs [0211]-[0212]). On the other hand, the present invention discloses a composite material formed of an organic

compound and an inorganic compound. Additionally, for example, in the case of using a composite material formed of CBP as an organic compound (aryl carbazole) and molybdenum oxide as an inorganic compound (metal oxide), the data shows that the composite material is a different material from CBP because the absorption spectrum of the composite material of the present invention has a different spectrum from the spectrum of CBP (please see, paragraph [0142] and the range of visible light in Figure 12).

The Applicant respectfully submits that Sato does not teach or suggest that a composite material formed of an organic material and an inorganic material is a different material from the organic material. Further, if one were to simply combine the metal oxides of Sato into a hole transport layer, then the Applicant respectfully submits that changes to the organic material and the inorganic material would be highly unpredictable; therefore, it would be difficult for one of ordinary skill in the art at the time of the present invention to necessarily expect to achieve the above-referenced effects of the present invention. In other words, the Official Action has not demonstrated why one of ordinary skill in the art at the time of the present invention would have necessarily expected to have been successful when combining the metal oxides of Sato into a hole transport layer, much less a clear reason why such combination would have been obvious in the first place.

Further, the Applicant respectfully submits that each of Seo, Shiratsuchi and Shiota does not cure the above-referenced deficiencies in Sato.

Therefore, the Applicant respectfully submits that Sato, Seo and Shiratsuchi or Shiota, either alone or in combination, do not teach or suggest a composition comprising an organic compound and a metal oxide or a layer including an organic compound and a metal oxide.

Since Sato, Seo and Shiratsuchi or Shiota do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly,

reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraph 7 of the Official Action rejects claims 1-3, 5, 6, 8, 9, 13-15, 17, 18, 20, 21 and 25-29 as obvious based on the combination of U.S. Publication No. 2005/0084712 to Kido and Shiratsuchi. Paragraph 8 of the Official Action rejects claims 1, 4, 7-9, 13, 16, 19-21 and 25-29 as obvious based on the combination of Kido and Shirota. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended.

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Independent claims 1-4, 8, 9, 13-16, 20 and 21 have been amended to delete "vanadium oxide" and "rhenium oxide." As such, the claims recite a composition comprising or a layer including an organic compound and "one of tantalum oxide, molybdenum oxide, tungsten oxide, and ruthenium oxide." For the reasons provided below, Kido and Shiratsuchi or Shirota, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

Kido appears to disclose vanadium pentoxide and dirhenium heptoxide in paragraphs [0030] and [0031], respectively. On the other hand, Kido does not teach or suggest tantalum oxide, molybdenum oxide, tungsten oxide or ruthenium oxide to form a composite material. Also, the Applicant respectfully submits that each of Shiratsuchi and Shirota does not cure the deficiencies in Kido.

Therefore, the Applicant respectfully submits that Kido and Shiratsuchi or Shirota, either alone or in combination, do not teach or suggest a composition comprising or a layer including an organic compound and "one of tantalum oxide, molybdenum oxide, tungsten oxide, and ruthenium oxide."

Since Kido and Shiratsuchi or Shirota do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly,

Since Kido and Shiratsuchi or Shiota do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraph 9 of the Official Action rejects claims 1-3, 5, 6, 8, 9, 13-15, 17, 18, 20, 21 and 25-29 as obvious based on the combination of WO 2005/031798 to Ikeda and Shiratsuchi. Paragraph 10 of the Official Action rejects claims 1, 4, 7-9, 13, 16, 19-21 and 25-29 as obvious based on the combination of Ikeda and Shiota. In order to overcome these rejections, a verified English translation of priority application JP 2005-085056 filed March 23, 2005, will be filed as soon as it is complete and received from Japan. Since Ikeda has an international filing date of September 24, 2004, and an international publication date of April 7, 2005, Ikeda is only potentially available as prior art under § 102(e). However, Ikeda, as a commonly owned reference under § 102(e), may not be considered for a rejection under § 103. Subject matter developed by another, which qualifies as prior art only under one or more of subsections 35 U.S.C. §§ 102(e), (f) and (g), is not to be considered when determining whether an invention sought to be patented is obvious under 35 U.S.C. § 103, provided the subject matter and the claimed invention were commonly owned at the time the invention was made. See MPEP § 2146. Since the disclosure by Ikeda and the claimed invention of the present application were, at the time the invention was made, subject to an obligation of assignment to Semiconductor Energy Laboratory Co., Ltd., Ikeda may not be considered for a rejection under § 103. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraphs 12-17 of the Official Action provisionally reject claims 1-9, 13-21 and 25-29 under various doctrines of double patenting over the claims of U.S. Patent Application Serial No. 10/571,891 to Ikeda, either alone or in combination with Shiratsuchi or Shiota. The Applicant respectfully requests that the provisional double patenting rejections be held in abeyance until an indication of allowable subject matter

is made in the present application. At such time, the Applicant will respond to any remaining double patenting rejections.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized to charge fees under 37 C.F.R. §§ 1.16, 1.17, 1.20(a), 1.20(b), 1.20(c), and 1.20(d) (except the Issue Fee) which may be required now or hereafter, or credit any overpayment to Deposit Account No. 50-2280.

Respectfully submitted,



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